Rec 9-5000-11-4-70

FACT SHEET

L-946

THE NANTUCKET PINE TIP MOTH

Jack E. Coster*

The Nantucket pine tip moth *(Rhyacionia frustrana* Comstock) is a small moth occurring throughout the pine forests of southern and eastern United States. In Texas, the larvae are responsible for an immense amount of damage to small pines in plantations, forests and ornamental plantings (See figure 1). Although trees are seldom killed by its attacks, repeated infestations reduce the growth rate and cause deformation of the main stem, loss in wood quality and a bushy appearance. Open-growth trees less than 15 feet tall are most severely attacked. Of the native Texas pines, shortleaf and loblolly pine are especially susceptible to attack while slash and longleaf pine are very resistant.

Fig. 1. Typical pine tip moth damage (right).

DESCRIPTION

The adult moth (See figure 2) has a wingspread of about ½ inch and is generally a reddish-brown color with silver-grey markings. Wings are folded over the abdomen when the moth is at rest and adults are quite inconspicuous on foliage because of their small size and protective coloration.

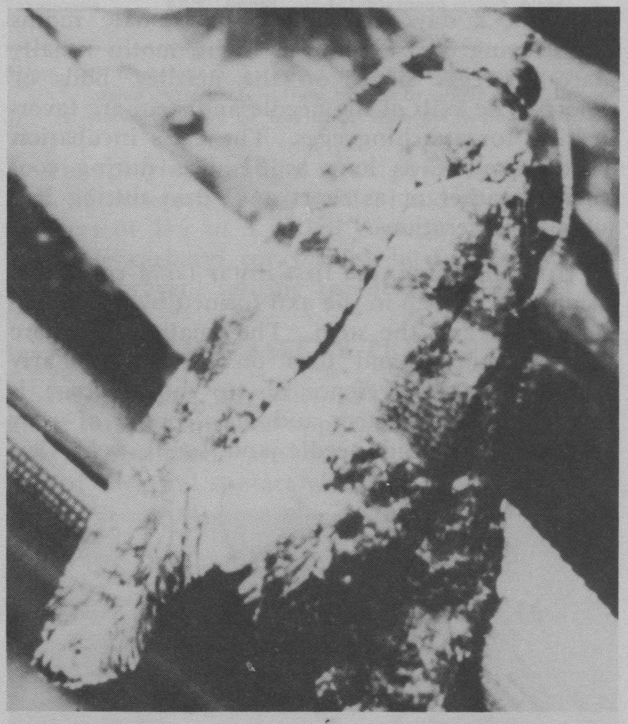

Fig. 2. Adult Nantucket pine tip moth is reddish-brown in color with silver-grey markings.

The eggs are 1/32 inch in diameter, white to orange in color. When young, the larvae are tiny, cream-colored caterpillars approximately 1/16 inch long. The head is black. Full grown larvae reach a size of about ¼ inch in length and are colored light brown to orange (See figure 3). The pupae, when first formed, are about the same color as the full grown larvae but become darker as they mature.

*Area Extension entomologist, Texas A&M University, Overton.

Texas A&M University • Agricultural Extension Service • John E. Hutchison, Director • College Station

Fig. 3. Although greatly magnified in this photo, the full-grown larva of the pine tip moth is only about ¼ inch in length and light brown to orange in color.

LIFE HISTORY

The tip moth spends the winter months as a pupa within the injured terminals and twigs of the tree. About mid-March, the pupae, with the aid of a series of abdominal spines, work their way out of the infested tips. The adult moth is then free to emerge, leaving the empty pupal case projecting from the twig.

About 2 days after emerging, female moths begin laying eggs. Flying at night, moths usually place the eggs singly on the needles, buds or shoots. The axils of the needle and stem are favorite sites for attaching eggs. The egg's incubation period may be as long as 31 days during cool spring weather or as short as 9 days during late summer generations.

Upon hatching, the first instar larva constructs a small silken web in the axil formed by a developing needle and the stem. The small larvae bore into the needle and feed on the stem. Early evidence of the presence of tip moth larvae is thus difficult to detect and may consist of only an occasional dead needle and small webs (See figure 4).

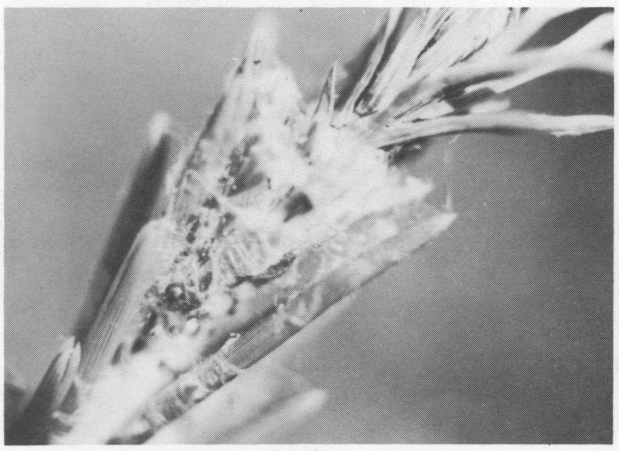

Fig. 4. Early evidence of pine tip moth infestation is webbing and an occasional dead needle.

As the larva develops, fecal material and resin exuded from the stems begin to accumulate on the outside of the tips. Eventually the mining of the larva severs the conductive tissue of the tip and the affected portion turns brown. The bud seems to be the most desirable food of the new shoots. After the bud has been eaten, the larvae bore down the center of the young stem. It is not uncommon to find several larvae in a single shoot. The larvae feed for 2 to 4 weeks before pupation occurs in a silken cell within the injured terminal. In Texas, there are usually 4 generations each year. During very favorable seasons, a fifth generation may occur.

DAMAGE

The Nantucket pine tip moth may damage the tree by causing poor tree shape, stunting growth, reducing cone crops and, in severe instances, bring about the tree's death.

Repeated attacks of tip moths result in conspicuous damage to plants and cause them to become many-branched and very unsightly. The trees' value for ornamental purposes may be greatly reduced (See figure 5).

Fig. 5. Unsightly, many-branched appearance of loblolly pine is result of pine tip moth attack.

The moth's economic impact on native pine forests is not known with certainty. A significant difference in growth of protected and unprotected trees during the early years of growth has been found in several studies. However, this difference in growth appears to lessen as the trees grow older. The final effect of tip moth attack when the trees are of merchantable size is unknown.

Although tip moth injury is generally most severe on trees less than 15 feet tall, heavy infestations of larger trees also are known. In their feeding activities, the larvae may sever cone-bearing branches preventing cone development. This damage is more important in pine seed orchards where genetically superior trees are grown for production of pine seed to meet reforestation needs.

Outright tree-killing by pine tip moths is uncommon. Where it does occur, trees are often growing on poor sites or under drought stress.

PREVENTION

Maintenance of high tree thrift is one of the most effective methods for reducing the incidence of tip moth damage. Management practices that promote rapid growth through the first 6 to 8 years of age will lessen the time spent in the susceptible stage of tree development. Shading tends to reduce tip moth injury. Pines grown in dense stands or under the canopy of older trees are less injured than are open-grown, unshaded pines. Homeowners can reduce tip moth injury by proper watering and fertilization of their ornamental pines. Plantings of slash and longleaf pines are highly resistant to the moth attacks.

CONTROL

Presently, there is no effective control of Nantucket pine tip moth for large forest areas. Even for the more restricted plantation areas, controls are not highly successful because of migration of moths from adjacent, untreated forest stands.

For high value ornamental trees, such as ornamental pines and seed orchard trees, control may be accomplished with insecticidal sprays. Spray timing is of utmost importance to obtain an effective kill. Spray when moths are most active and plentiful on the foliage. In Texas, the four applications should be made about April 1, June 1, July 15 and September 1. Thoroughly cover the foliage and twigs, especially on the upper half of the tree crown. Sprays, rather than dusts, are more effective since they form a longer-lasting residue on the needles. If heavy rains occur within 2 days after spraying, re-spray the trees. Recommended insecticides are:

Chemical	Formulation	Amount of Formulation* Per gal. of water	Per 100 gal. of water
Carbaryl (Sevin)	50% wettable powder	2 tablespoons	2½ pounds
Malathion	50% liquid concentrate	1 tablespoon	3 pints
Toxaphene	60% liquid concentrate	1 tablespoon	3 pints

*Note: If formulations are used in which the percentages of active ingredients differs from that above, mix proportionately more or less of it with the water.

For spraying standing trees, power sprayers are best. If these are not available, hand pressure type sprayers of 1½ to 3 gallon capacity are suitable. Wettable carbaryl spray must be frequently agitated to prevent settling in the tank.

INSECTICIDE SAFETY PRECAUTIONS

Before using any chemical ***read the label*** to make sure that proper application procedures and safety precautions are carried out. Avoid prolonged chemical contact with skin. Wash exposed skin areas with generous amounts of soap and water.

Store chemicals in locked cabinets out of children's reach. Clean all application equipment and accessories thoroughly after use.

Cooperative Extension Work in Agriculture and Home Economics, Texas A&M University and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.
5M—8-70 FOR 2, ENT